

Errata to IEEE Specification Format Guide and Test Procedure for Two-Degree-of Freedom Dynamically Tuned Gyros

Sponsor

Gyro and Accelerometer Panel Committee

of the

IEEE Aerospace and Electronic Systems Society

Correction Sheet

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Table of Contents, Page vii, should be corrected to read as follows:

10.13 Dynamic Time Constant.....56

3.3.10.7, Page 6, sentence should be corrected to read as follows:

The One-N (1N) modulation shall not exceed _____ mV [rms, peak-to-peak].

3.3.11.2.2, Page 7, sentence should be corrected to read as follows:

The difference between the command rate scale factor measured with positive and negative input rates shall not exceed _____ [(rad/s)/mA, (rad/h)/mA, (°/s)/mA (°/h)/mA].

3.3.11.3.1, Page 7, sentence should be corrected to read as follows:The change in command rate scale factor resulting from a change in steady-state operating temperature shall be _____ \pm _____ [((rad/s)/mA)/°C, ((rad/h)/mA)/°C, ((°/s)/mA)/°C, ((°/h)/mA)/°C]**3.3.14.1, Page 8, sentence should be corrected to read as follows:** $D(y)_F, D(x)_F 0 \pm$ _____ °/h.**3.3.23, Page 10, sentence should be corrected to read as follows:**_____ °/h [maximum spread, 1σ , _____], each axis for a period of _____ [minutes, hours, days, _____].**3.3.28.1, Page 12, sentence should be corrected to read as follows:**_____ [g · cm²/s, dyn · cm · s].**3.5.1, Page 17, sentence should be corrected to read as follows:**

The electrical circuits shall be connected as shown in [drawing number _____, Fig _____].

3.6.4.1.2, Page 23, the text in the box should be corrected to include the last sentence as shown below:

Axes shall be defined. When available, supply the specific vibration characteristics including dwell frequencies, frequency spectrum time duration, etc.

If exposure to random vibration is required, power spectral density, bandwidth, peak acceleration level and duration shall be specified.

3.6.4.4, Page 23, the second sentence should be corrected to read as follows:The gyro shall perform within specification after positive and negative angular accelerations of _____ [rad/s², °/s²] have been applied about the _____ [axis, axes] for _____ seconds a total of _____ times per direction.**3.6.4.8, Page 24, sentence should be corrected to read as follows:**_____ [Pa, torr, in Hg, lbf/in²] to _____ [Pa, torr, in Hg, lbf/in²]**6.3, Page 32, the y-axis is missing the symbol Theta in three places, should be corrected to read as follows:**

$$\frac{1}{H} [I\ddot{\theta}_x - C(\dot{\theta}_x - \dot{\theta}_x) - K_D(\theta_x - \theta_x) - K_Q(\theta_y - \theta_y)]$$

Page 32, ACCELERATION-SQUARED-SENSITIVE DRIFT RATE, should be corrected to read as follows:

$$+ D(y)_{XZ} a_X a_Z + D(y)_{YZ} a_Y a_Z$$

6.3, Page 33, the x-axis is missing the symbol Theta in three places, should be corrected to read as follows:

$$-\frac{1}{H} [I\ddot{\theta}_y - C(\dot{\theta}_Y - \dot{\theta}_y) - K_D(\theta_Y - \theta_y) + K_Q(\theta_X - \theta_x)]$$

Page 33, ACCELERATION-SQUARED-SENSITIVE DRIFT RATE, should be corrected to read as follows:

$$+ D(x)_{XZ} a_X a_Z + D(x)_{YZ} a_Y a_Z$$

6.3, Page 33, Model Equation, the last three items of the “where list” should be corrected to read as follows:

$D(y)_X a_X$	= drift rate about the y axis, attributable to acceleration along the X axis, where $D(y)_X$ is a drift rate coefficient
$D(y)_Y a_Y$	= drift rate about the y axis, attributable to acceleration along the Y axis, where $D(y)_Y$ is a drift rate coefficient
$D(y)_Z a_Z$	= drift rate about the y axis attributable to acceleration along the Z axis where $D(y)_Z$ is a drift rate coefficient

9.1.1.4.3, Page 36, item 1) should be corrected to read as follows:

1) Acceleration: _____ rad/s² maximum

9.1.3.1, Page 36, item 7) should be corrected to read as follows:

7) Phase-splitting capacitor: _____ ± _____ μF

10.13, Page 56, title of subclause should be corrected to read as follows:

Dynamic Time Constant

10.2.2.1, Page 40, the sentence should be corrected to read as follows:

The purpose of this test is to ascertain that a circuit element or component part of the gyro can operate safely at its rated voltage and withstand momentary overpotentials due to switching, surges, etc, by measuring the leakage current between isolated circuits and between the gyro case and the circuits isolated from the gyro case.

10.6.3.2, Page 45, second sentence of the first paragraph should be corrected to read as follows:

Using the torquer, rotate the gyro rotor until the pickoff output at the previously measured phase angle is a minimum. Record this voltage as the in-phase null, a voltage 90° out-of-phase with this voltage as the quadrature voltage, and the total voltage.

10.14.3.4.3, Page 61, first sentence of the third paragraph should be corrected to read as follows:

Begin a second accumulation of pulses. After _____ seconds, T_2 , unlock the table and oscillate it at a frequency of _____ ± _____ Hz and a peak amplitude of _____ ± _____ [°, rad].

10.14.3.5, Page 62, item 2 should be corrected to read as follows:

2) *Two-N (2N) Translational Sensitivity*. Mount the gyro in the fixture on the linear vibrator with the Z axis nominally perpendicular to the direction of vibration. Operate the gyro in the angular rate sensing mode (see 8.2) in accordance with the test conditions of 9.1. Record the X and Y torquer currents, i_{X1} , and i_{Y1} , prior to vibration. Apply a linear sinusoidal vibration at a frequency locked to twice the gyro spin speed at an amplitude equivalent to _____ g [peak-to-peak, rms, _____]. Vary the phase between the vibrator and gyro motor frequencies to obtain maximum X torquer current i_{X2} . Record i_{X2} and the Y torquer current i_{Y2} . Subsequently vary the phase to obtain maximum Y torquer current i_{Y3} . Record i_{Y3} and the X torquer current i_{X3} .

10.14.4.8.1, Page 67, first paragraph should be corrected to read as follows:

Divide the recording of the gyro X and Y torquer currents obtained in 10.14.3.9 into L equal time intervals of _____, Mins. Determine the average X and Y torquer currents during each interval. The random drift rates (1σ) are then calculated as:

10.14.4.8.1, Page 68, the sentence should be corrected to read as follows:

where V_i is the average value of the i th sample, \bar{V} is the mean value of the L samples, and KTO is the nominal gyro command rate scale factor as determined in 10.7.4.1. The random drift rates shall conform to the requirements of Section _____.

10.17.3.1, Page 73, item 3 should be corrected to read as follows:

Method 1C. Connect the gyro torquer to the current integrator and recording equipment. Start the recorder and record the output for _____ [min, h]. Repeat with the other axis oriented east.

Annex C, Page 82 the equations in the where list should be on one line as shown below:

$$q_x = \frac{a}{2}\ddot{\theta}_x + a\omega_s\dot{\theta}_y - \left(a - \frac{c}{2}\right)\omega_s^2\theta_x$$

$$q_y = \frac{a}{2}\ddot{\theta}_y - a\omega_s\dot{\theta}_x - \left(a - \frac{c}{2}\right)\omega_s^2\theta_y$$

Annex C, Page 82, in the where list; the following line should be corrected to read as follows:

ω_s = angular velocity of rotor about spin axis

Annex C, Page 83, Equation C-3 and Equation C-4 should be corrected to read as follows:

$$I\ddot{\theta}_x + f\dot{\theta}_x + K_D\theta_x + J\omega_s\dot{\theta}_y + K_Q\theta_y = M_x \quad \text{C-3}$$

$$I\ddot{\theta}_y + f\dot{\theta}_y + K_D\theta_y - J\omega_s\dot{\theta}_x - K_Q\theta_x = M_y \quad \text{C-4}$$

Annex C, Page 84, the second paragraph immediately after the where list should be corrected to read as follows:

We can get some idea of the effect of case motion with the use of a series of block diagrams showing the DTG in various degrees of complexity starting with the simplified configuration (that is, Eqs C-5 and C-6).